ACCURATUS

CENTRIFUGAL
ANALYSIS.

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ROCHESTER, N. Y.

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BAUSCH & LOMB OPTICAL CO.'S

SPIRAL GEAR URINARY CENTRIFUGE.

(Patent Applied For.)

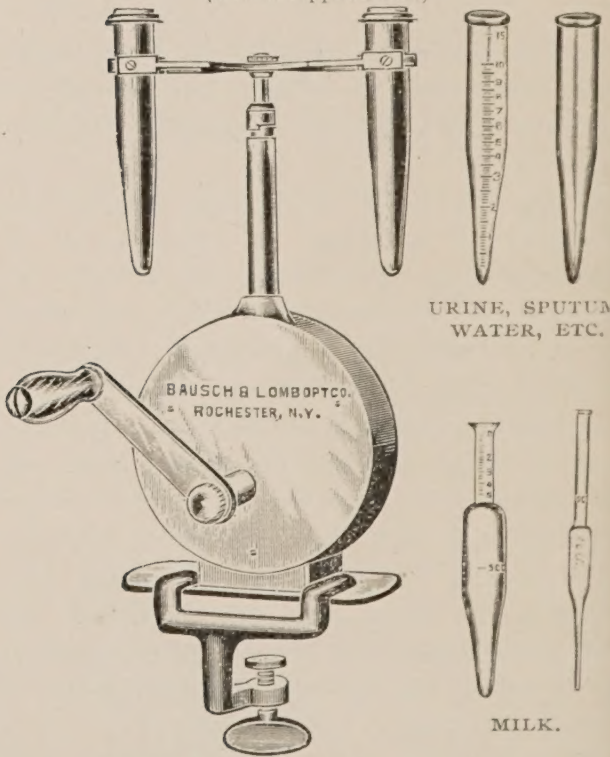


Fig. one-fourth actual size.

URINE, SPUTUM, MILK AND WATER ANALYSIS.
SPEED, 2000 TO 3000 PER MINUTE.

This Centrifuge has one Graduated Urine Tube, capacity 15 c. c., and one Ungraduated Tube of the same capacity. The tubes are protected by aluminum shields and rest on elastic cushions to prevent breakage. Special Milk Tubes for determination of fats are also supplied.

THE URINARY CENTRIFUGE.

The Centrifuge is *necessary for the accurate examination* of the solid and cellular elements of urine for the following reasons:

It is possible by centrifugalizing the urine to obtain complete precipitates in *three minutes*, whereas, by the older method of sedimentation by gravity, 12 to 24 hours were necessary, and even then some of the lighter elements, i. e., casts, fibres, etc., failed to precipitate. During this period of standing, such chemical changes are certain to take place as to not only make the task of examination much more disagreeable, but also more difficult and in some cases fruitless, owing to the obliteration of much of the evidence which the urine, when fresh, contained.

By the centrifugal method, the substances in the urine, whether they be crystalline, cellular or bacterial, may be examined microscopically and determined chemically without delay and without degeneration from the exact condition as found in the body.

The Centrifuge proper consists of a small circular case, containing the train of hardened bronze gears. It is attached to the table by screws if to be used in perma-

nent position, or by screw clamp if it is intended to carry the instrument about.

It is the smallest Centrifuge made, yet it is amply strong and a speed of 3,000 revolutions per minute is easily maintained.

The gears are of extra hardened bronze and the TEETH ARE SPIRALLY CUT. This is the *only Centrifuge made* having spiral toothed gears. This form of gearing *runs much easier and lasts longer* than any straight cut gearing as it prevents backlash or lost motion and three teeth engage at all times with a shearing contact instead of in the jarring fashion of the straight tooth gear. It is practically noiseless at the highest speeds.

The tubes for containing the urine are carried in aluminum shields to prevent breakage, and each tube has a capacity of 15 c. c. of fluid. The first 10 c. c. of one tube are graduated into 100 parts, permitting direct percentage readings of the precipitates, and there is a mark at the 15 c. c. point to facilitate the addition of reagents to cause precipitation. (See Purdy, et al, Urinary Analysis and Diagnosis.) The other tube is not graduated, the precipitates being intended for microscopic examination. An elastic cushion prevents breakage during rotation.

URIC ACID.

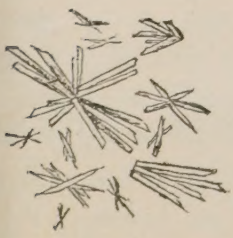
ACID AMMONIUM URATE.

Centrifugal Urine Analysis.

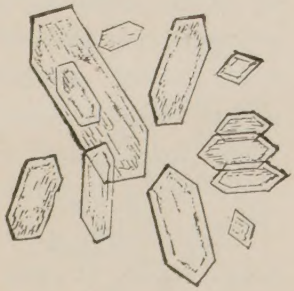
The ungraduated tube is filled with the urine to be examined, the sediment from which is to be prepared for the microscope. The graduated tube is filled only to the 10 c. c. mark, the remaining 5 c. c. of space being filled with the proper reagent for precipitating the chemical substance which it is desired to determine.

Having filled BOTH TUBES EXACTLY ALIKE, the handle of the instrument is rotated at a *uniform speed* for about three minutes, when the solid substances will be found in the distal portions of the tubes.

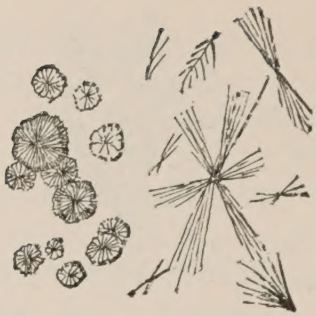
The sediments of urine are *chemical* and *anatomical*.



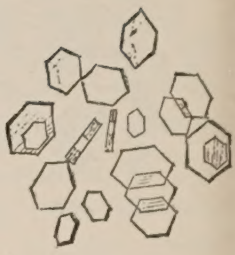
SODIUM URATE.



UREA NITRATE.



LEUCIN. TYROSIN.



CYSTINE.

The *chemical sediments* rarely appear as such in fresh normal urine, and, hence, a reagent must be added to quickly precipitate them for quantitative determination.

The chief chemical deposits are uric acid, the urates, calcium oxalate, cystine, leucin, tyrosin and the phosphates, typical forms of which are illustrated herewith.

The most important are the *chlorides*, *phosphates*, and *sulphates*. These may be precipitated and the percentage of each, existing in any given specimen of urine, determined as follows:

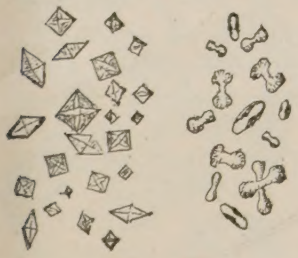
Chlorides—Fill graduated tube to 10 c. c. mark with fresh urine; add a few drops of nitric acid to prevent precipitation of phosphates, and fill tube to 15 c. c. mark with silver nitrate solution (one grain silver nitrate dissolved in one ounce distilled water) and rotate handle at speed of sixty turns per minute for three minutes.

The normal quantity of chlorides ranges from 16 to 18 per cent., as indicated by this test.

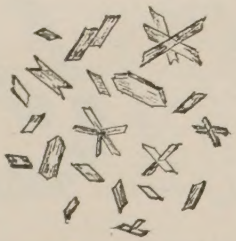
TRIPLE PHOSPHATES.

Phosphates—Fill graduated tube to 10 c. c. mark with fresh urine and add 5 c. c. of ammonia solution, (magnesium chloride and magnesium sulphate, equal parts, 1 part; distilled water 8 parts, liquor ammonia 1 part.) Rotate at speed of sixty turns of the handle per minute for three minutes. The normal quantity of phosphates, as indicated by this test, is 8 to 12 per cent.

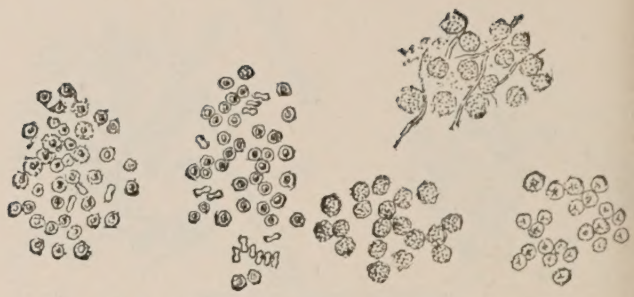
Sulphates—Fill graduated tube to 10 c. c. mark with fresh urine and add 5 c. c. barium solution, (4 parts baric chloride, 1 part hydrochloric acid, 16 parts distilled water.) Rotate at speed of sixty turns of the handle per minute for three minutes. The normal amount of sulphates, as indicated by this test, is 1 per cent. For the



CALCIUM OXALATE.



HEMIN.

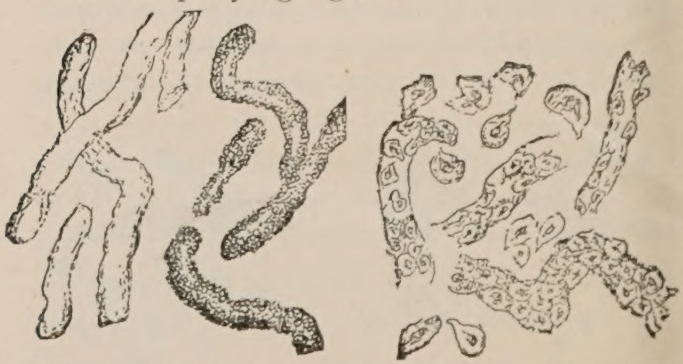


BLOOD CORPUSCLES. MUCUS AND PUS.

precipitation of other sediments, we refer to current literature and standard authors on urinary analysis.

A small portion of the sediment from the ungraduated tube should be placed upon a perfectly clean glass slide and covered with a No. 2 cover glass, after which the preparation should be carefully searched for casts, epithelium, blood or pus corpuscles, fibrous elements, etc.

Good plates of all these, as found in normal and abnormal urine, are now published in all reference books on the subject. A few of the most common are shown in the accompanying figures.



HYALINE CASTS. GRANULAR CASTS. EPITHELIAL CASTS.

WAXY CASTS. CASTS WITH BLOOD CORPUSCLES. CASTS WITH FAT GLOBULES.

Sputum Examination with the Centrifuge.

The advantages of the Centrifuge for sputum examination are :

In cases of suspected tuberculosis, where but few bacilli, fibres, etc., may be present, these few are collected together at the peripheral extremity of the tube, and the probabilities of finding them are increased as many times as the volume of sputum contained in the tube, is greater than the volume of sputum smeared upon the cover glass, with the old method.

A considerable quantity of the sputum is energetically beaten with a glass rod in a porcelain dish until it is entirely fluid—a few moments suffice for this operation—an equal portion of the sputum is then placed in each tube and rotated at high speed for three minutes.

Decant fluid from the ungraduated tube and examine a portion of the deposit under medium power for elastic fibres, without staining. If fibres are present, they cannot escape detection by this method. Charcot-Lyden crystals and the spirals or Curschman in the sputum of asthmatic patients, are demonstrated in the same manner as elastic fibres.

How to Stain Tubercle Bacilli.

When tubercle bacilli are suspected, decant the fluid portion from one tube and remove a small portion of the sediment from the extremity of the tube with a sterilized platinum loop and smear thinly on a No. 2 cover glass.

Fix by passing through flame of alcohol lamp three times and stain by either of the following methods:

Burrill's Stain.

Drop three drops of the stain into a watch glass containing one dram of hot water; stir until thoroughly mixed; drop the smeared cover into the fluid, sputum side down, and let it remain thirty minutes.

Decolorize, (nitric acid 1 part, alcohol 4 parts) wash in water, dry on filter paper and mount in Canada balsam.

Gibbs' Double Stain.

Grasp the prepared cover glass by the edge, sputum side up, with a pair of Stewart's forceps; cover the film of sputum with Gibbs' stain and heat over spirit lamp so that vapor is given off for two minutes; decolorize in alcohol; dry and mount in Canada balsam.

Ziehl's Carbol-Fuchsin Method.

Immerse prepared cover glass in a watch glass of Ziehl's Carbol-Fuchsin solution and let remain five minutes. Wash in water until no more color comes away, then pass three times through nitric acid solution

(nitric acid 1 part, water 4 parts) wash in water and drop for 1 minute in Loeffler's Alkaline Blue Solution, wash in alcohol until no more color comes away, blot and mount. This gives a deep red color to the tubercle bacilli and stains other elements blue. It is a very simple and reliable method.

Centrifugal Milk Analysis.

Tubercle bacilli in milk can be quickly detected by examining the precipitate from a tube full of the suspected milk, fixing and staining as in case of sputum.

For determining the amount of fats in milk the special milk tubes and a volume pipette are required as the fats, being lightest, are found in the proximal portion of the tubes after centrifugation.

The separation of the fats is also aided by the addition of proper reagents, a very accurate method being that of Leffman & Beam, viz:

A sufficient quantity of the milk to be tested is introduced into the Milk Tube to fill it to the 5 c. c. mark. 1 c. c. of the hydrochloric solution (hydrochloric acid 50 volumes, methyl alcohol 13 volumes, fusel oil 37 volumes), is added and mixed by lively shaking. Sulphuric acid of Sp. Gr. 1.83 is then added drop by drop until the tube is filled to the zero mark. The milk should be constantly agitated during addition of the sulphuric acid. Both tubes should be filled similarly.

Rotate in the Centrifuge until fats separate (1 to 2 min.) and read per cent. of fats direct from scale.

The following may be regarded as the normal constitution of milk according to Leffman :

HUMAN MILK.	COWS MILK.	
87.30	87.50	Water.
7.00	4.30	Sugar.
4.00	3.50	Fats.
1.50	4.00	Proteids.
.20	.70	Salts.

As the Milk Tubes are graduated to read only to 5 per cent., where the fats will exceed this amount dilute the milk with its own volume of water, mix thoroughly and use 5 c. c. for examination as above, but multiply the reading on the scale by 2.

Cream should be diluted with 4 volumes of water and the reading multiplied by 5.

Examination of Water.

Water examination is greatly facilitated by the use of the Centrifuge, as all solids whatever their nature, may be quickly precipitated and micro-organisms, vegetable detritus, etc., detected by microscopical examination of the sediment. Many forms which would escape the filter or would be destroyed before precipitation would ordinarily occur, are readily found.

For the Chemist.

Crystals or other solids in suspension in fluids may be precipitated at once and immiscible liquids, such as chloroform and water, separated, the heavier being found at the distal end of the tube.

SPIRAL GEARED TWO SPEED CENTRIFUGE.

(Patent Applied For.)

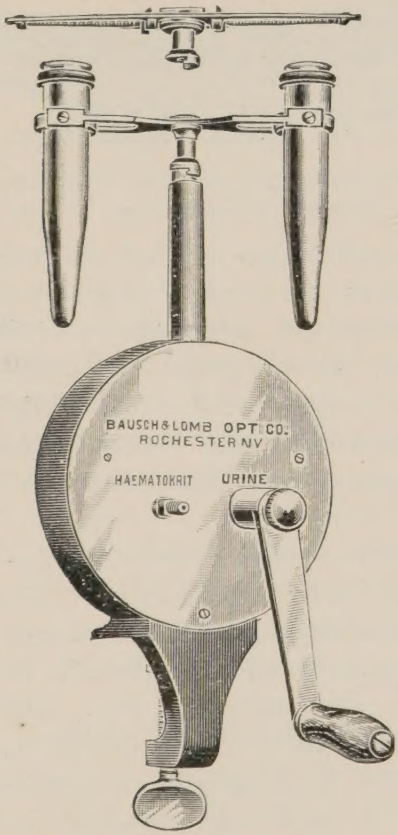


Fig. one-fourth actual size.

DALAND'S HAEMATOKRIT FOR BLOOD. URINE, SPUTUM, MILK AND WATER ATTACHMENTS. SPEEDS, 10,000 to 12,000 and 2,000 to 3,000 PER MINUTE.

This Centrifuge may be used at high speed for the Haematokrit and Sputum work and at low speed for Urine, Milk, etc., by simply changing the handle from one axle to the other. No "change-gear" or "loose gear" to loose or get out of order.

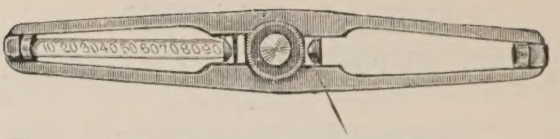


Fig. one-third actual size. PROXIMAL CUP

TOP VIEW OF HAEMATOKRIT.

Two Speed Centrifuge.

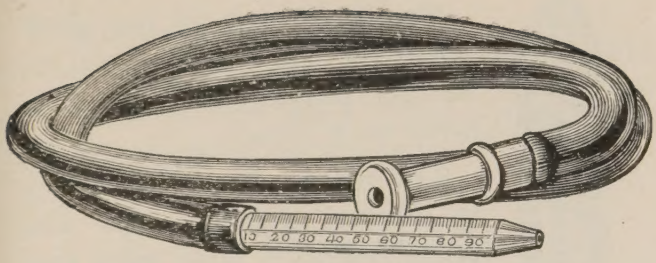
DALAND'S HAEMATOKRIT ATTACHMENTS.
URINE, SPUTUM, MILK AND WATER ANALYSIS.

This Centrifuge is but slightly larger than the single geared instrument previously described, although it contains an additional set of gears for attaining the high speed required for the Haematokrit. The Haematokrit and Urinary attachments are attachable and detachable by bayonet catch.

The Urinary Attachment is the same as described with the Urinary Centrifuge, and directions for using that, apply equally to this instrument for sputum, water and chemical precipitates. The Milk Tubes may also be used in this Attachment.

Daland's Haematokrit attachment consists of a very light though extremely strong metal frame, containing two glass tubes, 50 mm. long, each graduated to 100 parts and with a lumen of 0.5 mm. in which the blood to be examined is placed.

The Haematokrit offers the quickest, simplest and most accurate method for determining the actual number of red corpuscles in blood, no dilution of the blood being required.



SUCTION PIPETTE.

The Haematokrit as produced by some manufacturers possessed these defects: very noisy, due to imperfectly cut and centered gears; great force required to obtain the desired speed, due to imperfect construction; leaking of blood from blood tubes rendering machine useless and due to the same cause. The first two defects are entirely eliminated from our Centrifuge by the use of gears with spirally cut teeth. This construction reduces the friction, makes the gears wear longer and reduces the noise to practically nothing. We guarantee the blood tubes to remain filled.

Counting Blood Corpuscles.

The method of procedure is as follows: the lobe of the ear or ball of the thumb having been carefully cleaned and aseptisized, a puncture is made with the lancet shown below, and the drop of blood allowed to exude without pressure.

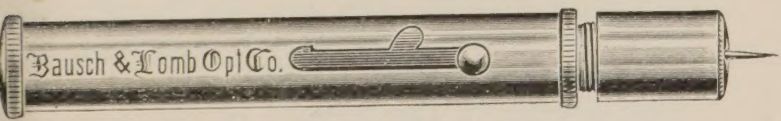
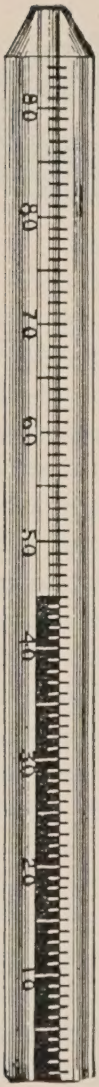


Fig. actual size.

DR. V. A. MOORE'S LANCET FOR DRAWING BLOOD.



PERCENTAGE TUBE.
Fig. twice actual size.

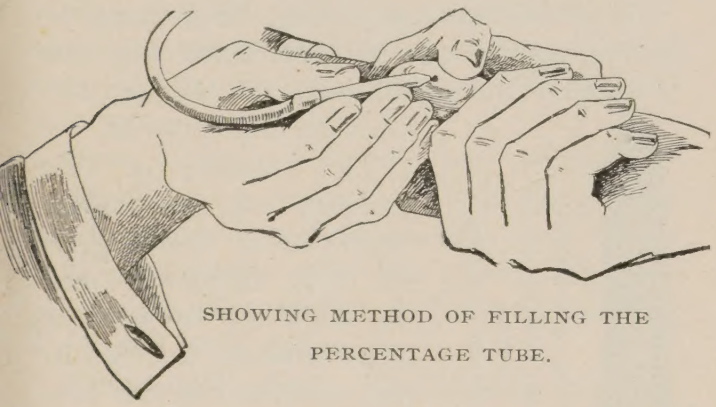
The blunt end of the graduated tube is attached to the suction pipette and the tube filled with blood.

The tip of the index finger is pressed tightly over the pointed end of filled tube and the pipette carefully removed. *The lumen of the tube must now be full of blood.* Place the blunt end of tube in distal cup of Haematokrit frame and press the pointed end down the inclined face of proximal cup until it falls into the cavity. It is of the greatest importance that the tube, when in place in the frame, should be perfectly filled with blood. The second tube should be also filled as a check.

Rotate at a speed of seventy-seven turns of the handle per minute for two minutes. All of the red corpuscles will now be found to occupy the distal end of the tube, and next to them a thin, and in many specimens, almost undiscernable whitish line, the white corpuscles, the liquor sanguinis occupying the proximal portion only.

The height of the column of red corpuscles is carefully read off, preferably

with a magnifier, and the reading multiplied by 100,000 will give the actual number of red corpuscles in a cubic millimeter of the blood under examination.



SHOWING METHOD OF FILLING THE PERCENTAGE TUBE.

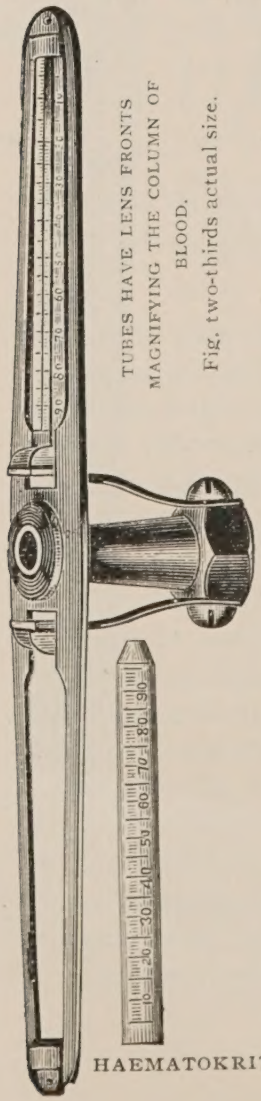
It is to be noted that in order to obtain uniform and accurate results, it is necessary to rotate the handle of the Centrifuge the specified number of times per minute under all circumstances, as this definite rotation represents a fixed amount of centrifugal force.

If a greater or less amount of force is used, the height of the column of red corpuscles will show a corresponding variation.

It is a further important fact that the length of the percentage tubes and their distance from the center of the Haematokrit frame must always remain the same as used in the original experiments by which the quantitative determinations were made, as any variation in these factors will produce a corresponding variation in the results.

The Haematokrit described above is constructed after the specifications of Dr. Daland, who has contributed practically all of the original work in this line, and is the only one which he recommends.

Other instruments should be avoided as giving results not in accordance with the published determinations of the authorities on this subject.



TUBES HAVE LENS FRONTS MAGNIFYING THE COLUMN OF BLOOD.

Fig. two-thirds actual size.

The rapidity of this process, as compared with that of counting, is at once apparent and its accuracy is greater than that of the counting method for the reason that no dilution of the blood is required, and and the personal element in counting of various squares does not enter in.

Sputum Examination with this instrument may be made as with the single geared centrifuge, but a pair of plain tubes is furnished for use in the Haematokrit frame, so that a small portion of the sputum may be centrifugalized at a speed of 10,000 revolutions per minute, insuring quicker deposition of the bacteria.

BIBLIOGRAPHY.

Prof. Blix at Upsala, Sweden, in 1885 first suggested the Centrifuge for the separation of red and white corpuscles and their volumetric estimation, taking advantage of the marked difference in specific gravity.

Later Dr. S. G. Hedin, upon this suggestion, constructed a Centrifuge and demonstrated its practicability.

The following year Dr. Judson Daland published the results of his experiments with this instrument.

Since then Prof. Van Jaksch at the Medical Congress in Wiesbaden and at Prague, and Dr. Judson Daland in various papers and at the International Medical Congress at Moscow, have presented the results of exhaustive experiments, establishing the accuracy of the centrifugal method. The principal papers are:

Daland—"Ueber die Brauchbarkeit der Centrifugal Kraft für quantitative Blutuntersuchungen." Separate-Abdruck aus dem Archive für der Ges. Phisiologie Bd. 60.

Daland—A Volumetric Study of the Red and White Corpuscles of Human Blood in Health and Disease by the Aid of the Haematokrit Univ. Med. Mag. Nov. 1891, and Fortschritte der Medicin, No. 20 and 21, 1891. Franklin Inst. Jour. Sept., 1893.

Daland—"A New Haematokrit, and a New Technique," read before the 12th Intern. Med. Cong., Moscow, Aug. 26, 1897.

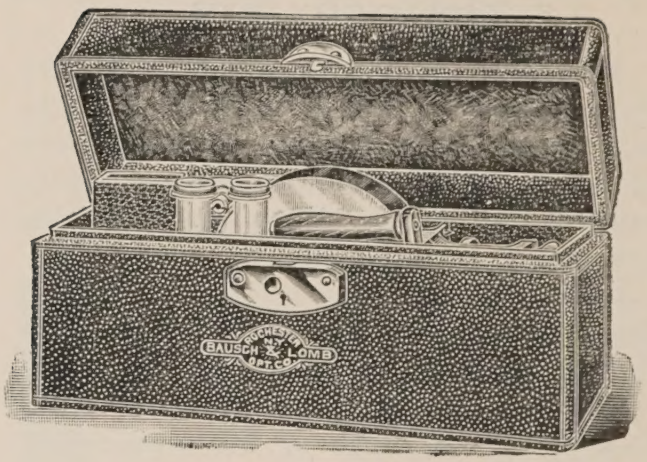


Fig. one-sixth actual size.
CARRYING CASE.

1819 **Urinary Centrifuge,** complete with Urinary Attachment, consisting of 1 graduated and 1 ungraduated glass Urine Tube and 2 Aluminum Shields on support, **$10.00**

1821 **Two Speed Centrifuge,** complete with Daland's Haematokrit and with 2 Sputum Tubes; Urinary Attachment with 1 ungraduated glass Urine Tube, 1 graduated glass Urine Tube and 2 Aluminum Shields on support, - - **$20.00**

1835 **Lancet** for drawing blood, **1.50**

1856 **Graduated Urine Tube,** **.75**

1861 **Ungraduated Urine Tube,** **.25**

1862 **Milk Tube,** - - **.75**

1863 **1. c. c. Volume Pipette,** **.10**

1864 **Black Leather Carrying Case,** for 1821 Centrifuge, with leather grip, nickeled hinges and lock, and with spaces for all accessories. Length 11 in., height 5 in., width 4 in. **$3.00**

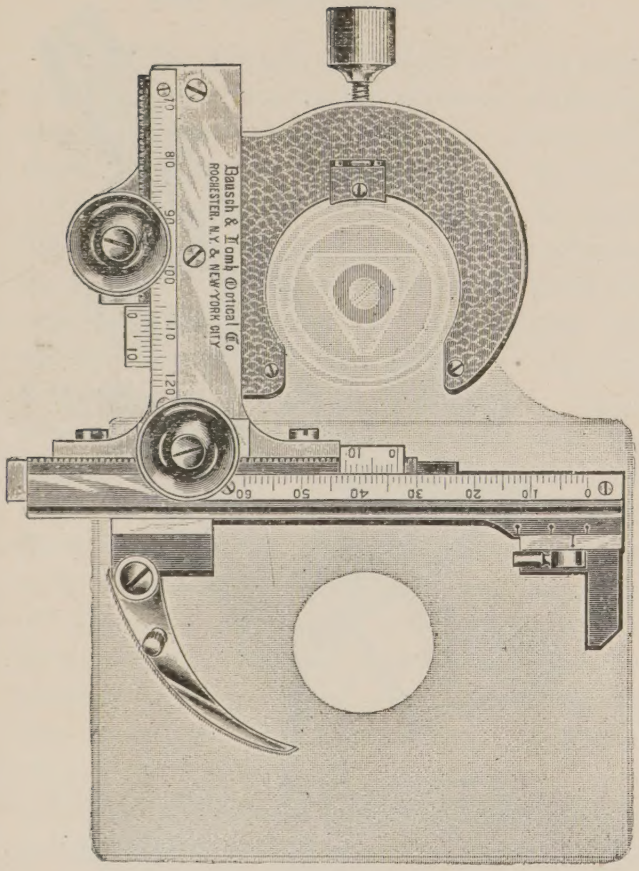


Fig. three-fourths actual size.

1555 **Attachable Mechanical Stage,** complete, in velvet-lined leather case, with directions for using, Price, - - - - **$18.00**

This Stage is indispensable for rapid and thoroughly accurate search work.

The rectangular movements are both by diagonal rack and pinion and have accurate graduations and verniers. This Stage is applicable to any Continental type microscope and can be easily attached by the purchaser.

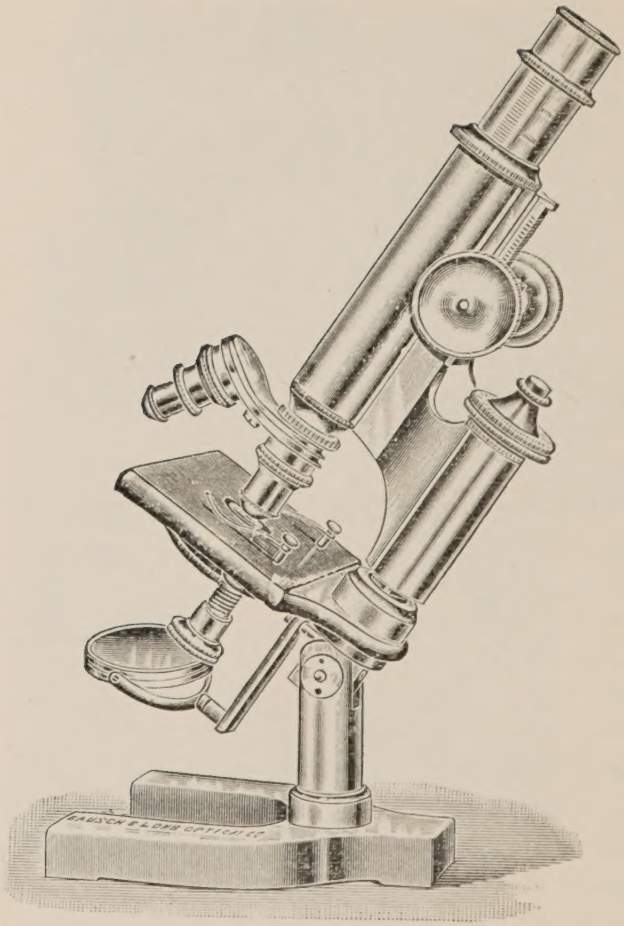


Fig. one-fourth actual size.

Bausch & Lomb Optical Co.'s BB4 Continental Microscope.

Two Eyepieces, 1½ and ¾ in. One ⅔ in. Dry Objective, Series I. One ⅙ in. Dry Objective, Series I. Double Revolving Nosepiece. Iris Diaphragm in stage. Magnifies 74, 130, 340 and 585 diam.

Price complete, - - -	$55.00
Attachable Mechanical Stage,	18.00

BB4 Continental Microscope.

The BB4 Microscope listed on the opposite page is complete for URINARY examinations, HISTOLOGICAL and PATHOLOGICAL work, except the examination of bacteria.

The Stand is of brass highly finished. The Stage is of hard rubber not affected by reagents and the opening is provided with Iris Diaphragm for convenient and accurate control of the light. It also has Sub-stage Attachment with quick acting screw, so that Abbe Condenser and Iris Diaphragm can be used if desired. The rapid adjustment of objectives is made by Rack and Pinion, while accurate focusing is by delicate Micrometer Screw, the head of which is graduated for measuring the thickness of objects. The Double Nosepiece is a great convenience, permitting the use of either objective without delay of removing from the microscope.

Each BB4 Microscope is furnished in a polished case, with nickeled handle and lock.

One advantage of purchasing this microscope for ordinary pathological work and urinary analysis is, that by the addition of the $\frac{1}{12}$ in. Oil Immersion Objective, Abbe Condenser and Iris Diaphragm, it is perfectly equipped for bacteriological work as well, and all these accessories can be added without sending the instrument to the factory to have them adjusted.

Each instrument has a registered serial number, and we guarantee it to be optically and mechanically perfect.

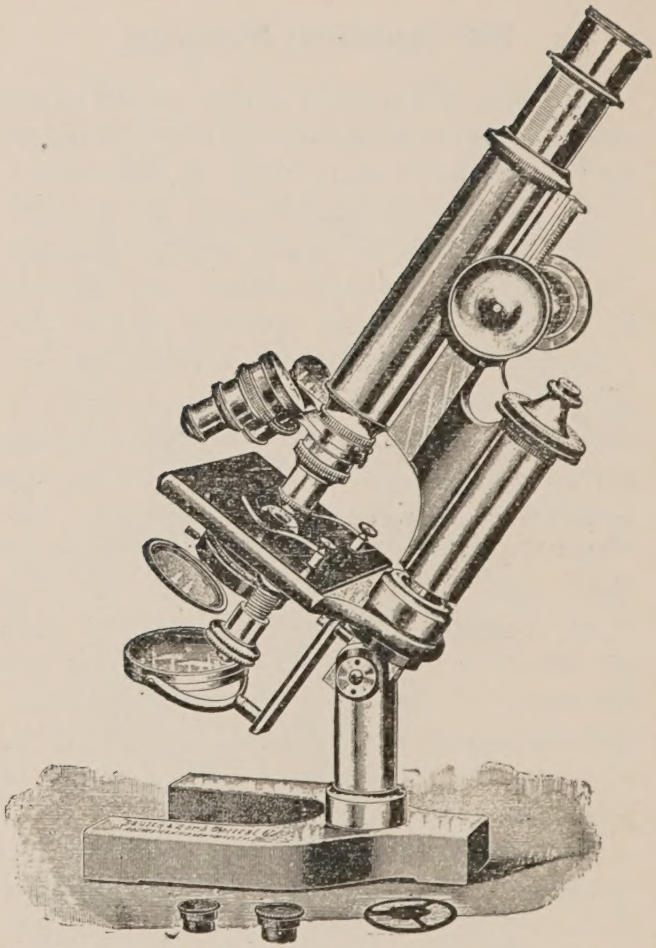


Fig. one-fourth actual size.

Bausch & Lomb Optical Co.'s BB8 Continental Microscope.

Two Eyepieces 1½ and ¾ in., one ⅔ in. and one ⅙ in. Dry Objective, Series I. One $\frac{1}{12}$ in. Oil Immersion Objective, N. A. 1.32. Abbe Condenser, large size, with Iris Diaphragm, Blue Glass and Dark Stop. Iris Diaphragm in stage. Triple Revolving Nosepiece. Magnifies 74, 130, 340, 585, 810 and 1,400 diam. Price, **$95.00**

Attachable Mechanical Stage, **18.00**

BB8 Continental Microscope.

The BB8 Continental Microscope outfit as listed on the opposite page is complete for all kinds of HISTOLOGICAL, PATHOLOGICAL, BACTERIOLOGICAL, and URINARY examinations.

It is now the standard microscope in the most advanced laboratories.

The Stand is of brass throughout beautifully finished and lacquered. Mirror is extra large, adjustable and has Centering Click.

The Sub-stage Condenser focuses by quick acting screw and has Iris Diaphragm below to govern the angle of light and its volume, also Blue Glass for work at night and Dark Ground Stop for examining crystals, etc.

The Stage is of hard rubber not affected by reagents. The opening in the stage has Iris Diaphragm so that the volume of light from the condenser can be controlled without limiting its angle. This feature is possessed by *no other microscope made* and is of the greatest value in Bacteriological work. The Rack and Pinion adjustment is so accurately made that the 1/6 in. objective is easily focused with it while the Micrometer Screw Adjustment permits the use of the highest power objectives made. The head of Micrometer Screw is graduated for measuring thickness of objects. The Triple Nosepiece is a great convenience, permitting the use of all three objectives in succession.

Each BB8 Microscope has polished case with nickeled handle and lock.

Each instrument has its serial number registered and we guarantee it to be optically and mechanically perfect.

Physician's Incubator.

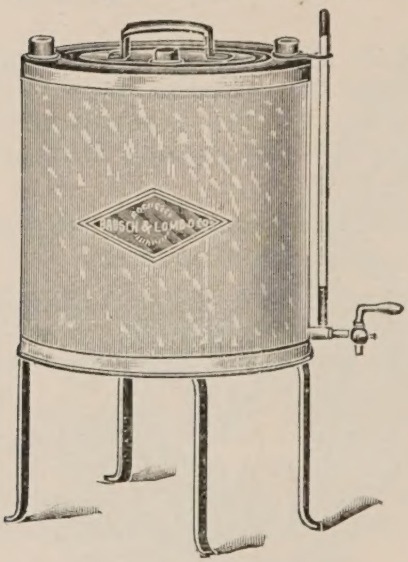


Fig. one-tenth actual size.

All Copper. Asbestos Covered. Incubating Chamber, 9 in. high, 8 in. diameter.

Price, $12.00

Physician's Hot Air Sterilizer.

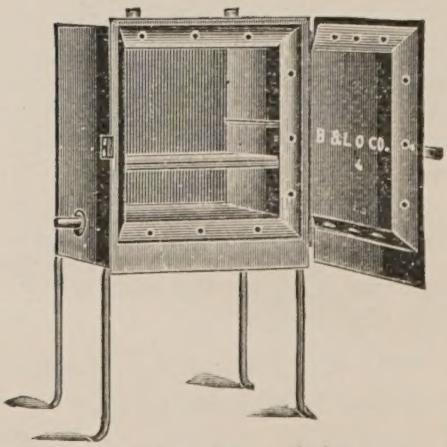


Fig. one-tenth actual size.

Inside measure, 9x6x6 inches.

Price, $10.00

Physician's Steam Sterilizer.

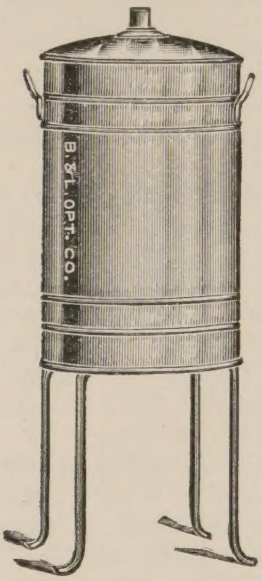


Fig. one-tenth actual size.

All Copper. Depth, 8½ inches, diameter, 8 inches

Price, **$3.50**

Apparatus for Bacteriological Laboratory.

Price if furnished complete, net, **$138.00**

1	BB8 Microscope, described above,	$95.00
1	Physician's Hot Air Sterilizer,	10.00
1	Physician's Steam Sterilizer,	3.50
1	Physician's Incubator,	12.00
2	Bunsen Burners for Sterilizer,	.80
1	Thermometer for Incubator,	1.00
1	Thermometer for Sterilizer,	1.50
1	Bunsen Burner for Incubator,	1.00
1	Improved Thermo-Regulator,	1.50
5	Ft. Rubber Tubing for Burner,	.40
1	Basket of Tin. Met. for Test Tubes,	.25
2	Test Tube Brushes,	.20
1	Cylinder Graduate, 250 c. c.,	1.00
1	Conical Graduate, 500 c. c.,	1.25
100	Round Filters, (s. & s.)	.40
6	Syracuse Watch Glasses,	.38
	Carry forward,	$130.18

Brought forward,	$130.18
12 Reagent Bottles, Glass Stoppered,	1.75
2 Lbs. Glass Tubing,	1.00
½ Doz. Glass Stirring Rods,	.30
100 Test Tubes, extra quality,	2.78
12 Rub. Caps for Closing Test Tubes,	.38
3 Koch Flasks, 500 c. c.,	.60
5 Erlenmeyer Flasks, 500 c. c.,	1.25
1 Mouse Jar, glass, wire top,	1.50
2 Platinum Incubating Needles,	.60
1 Graduated Pipette, 10 c. c. in. $\frac{1}{10}$ c. c.	.50
1 Test Tube Rack, wood,	.35
1 Scissors, straight, 4½ in.,	.35
1 Section Lifter, ¾ in. blade,	.35
1 Burette Stand with 2 Burettes, 50 c.c.	3.25
1 Glass Funnel, 80 mm.	.14
1 Water Bath, copper, 150 mm., 5 rings,	1.25
1 Iron Tripod for Water Bath, etc.,	.60
12 Petri Dishes, 100 mm. diam.	3.00
3 Scalpels, assorted sizes,	1.20
½ Gr. Glass Slips, white, gro'nd edge,	.43
½ Oz. No. 2 Cover Glasses,	.50
100 Gummed Labels,	.10
1 Agate Ware Bullion Boiler, 3000 c. c.,	.75
1 Ag't Ware Water Bath Boil'r, 2500 c.c.	2.00
1 Lb. Gold Label Gelatine,	.90
½ Lb. Agar Agar,	.50
1 Lb. Prep. Cotton for Plugging Tubes,	.40
Total,	**$156.91**

The above apparatus is all of the very best quality and includes only what is really required for actual work. Only such sundries are included as cannot be readily had at the local druggists.

To encourage the purchase of a complete outfit a liberal advantage in price is offered.

Laboratory Equipment for Qualitative and Quantitative Urinary Analysis.

Price if purchased complete, Net, **$75.00**

1 BB4 Microscope, described above,	$55.00
1 Urinary Centrifuge, " "	10.00
1 Einhorn's Saccharometer, -	1.00
1 Fermentation Tube, - -	.25
1 Esbach's Albuminometer, -	.75
1 Squibbs' Urea Apparatus, -	2.50
1 Urinometer, - -	.75
1 Burette Stand with 2 Burettes 50 c.c. and 25 c.c., - - -	2.95
1 Each, Volume Pipettes, 5 c.c., 10 c.c., 25 c.c., 50 c.c., - - -	.85
1 Thermometer, 100° C., 210 F.,	1.00
1 Sedimentation Glass, grad. 100 c.c.,	.50
3 Sedimentation Glasses, ungraduated,	.75
12 Reagent Bottles, glass stop., 150 c.c.	1.25
1 Test Tube on Foot, - -	.12
12 Test Tubes, - - -	30
1 Test Tube Rack, wood, -	.35
1 Water Bath, copper, 150 mm. 5 rings,	1.25
1 Iron Tripod for Water Bath, etc.,	.60
6 Beakers, 120 c. c., - -	.96
6 Syracuse Watch Glasses, - -	.38
1 Koch Flask, 500 c.c., - -	.20
1 Koch Flask, 2000 c.c., - -	.45
1 Wash Bottle, 500 c.c., -	.40
1 Ea. Evap. Dishes, 60 & 80 mm. diam.	.45
2 Glass Funnels, 80 mm. diam.	.28
1 Glass Stirring Rod, - -	.06
1 Spirit Lamp, Glass, - -	.70
½ Gr. Glass Slips, white, gr'nd edges,	.47
½ Oz. No. 2 Cover Glasses, -	.50
100 Labels for Slides, - -	.10
100 Filters (s. & s.) 150 mm. -	.40
100 Strips Red Litmus Paper,	.10
100 Strips Blue Litmus Paper, -	.10
Total,	$85.72

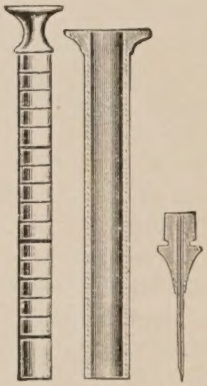
Accessories and Reagents for Microscopical Work.

No		Price.
	Continental Microscope Eyepieces, each,	$2.00
	1-12 in. Oil Immersion Objective, Series I,	38.00
	Abbe Condenser 1.20 N.A. with Iris Diaph.	10 00
	Double Nosepiece, Nickeled, -	5.00
	Triple Nosepiece, nickeled, - -	7.50
17	Coddington Magnifier in pocket case,	2.00
22	Coddington Magnifier with handle,	1.50
31	Aplanatic Triplet Magnifier in pocket case,	3.00
1725	Haemacytometer, Thoma-Zeiss,	13.50
1740	Haemaglobinometer, Gower's, -	2.50
1750	Haemaglobinometer, Gower's, more comp.	10.00
1760	Haemometer, Fleischl's, - -	35.00
2500	Mechanical Microtome, (cuts sections to 1-1000 in. thickness.) - -	20.00
4250	Syracuse Solid Watch Glasses, per doz.	.75
5585	Scissors, Microscopical, each, - -	.20
5700	Section Lifter, all metal, - -	.10
5730	Section Lifter, ebony handle, - -	.35
5855	Forceps for cover glasses, curved,	.20
5930	Stewart's Cover Glass Staining Forceps,	.25
5935	Cornet's Cover Glass Staining Forceps,	.50
7030	Complete set instruments for microscopic work, 1 Scalpel, 1 Scissors, 2 Needle Holders, 2 Forceps in Leather Case,	1.25
7315	Glass Slides, extra white, ground edges per doz. 12 cts., per gross, -	.85
7410	No. 2 Cover Glass, square ¾ in. per doz. 14 cts., per ounce, - - -	.80
7440	No. 2 Cover Glass, Circular, ¾ in., per doz. 16 cts., per ounce, - -	1.00
7665	Gummed Labels for slides, per 100,	.10
	Litmus Paper, red, blue, or neutral, Curcuma or Congo Paper, per 100 strips, in air tight vial, -	.10
9220	Slide Boxes for 25 slides, each 10 cts. per doz.	.75
9305	Slide Cabinet for 432 slides with 36 wooden trays and drawer, polished case,	10.00
9925	Manipulation of the Microscope, by Edward Bausch, a manual for the use of the microscope, -	1.00

No.		Price.
7755	Silver Nitrate, 30 grams.	$ .75
7765	Hydrochloric Acid, Sp. Gr. 1.18, 500 cc. inc.	.35
7796	Sulphuric Acid, 500 cc. inc.	.35
7780	Xylol, 30 cc. inc.	.30
7787	Formaline, 500 cc. inc.	.85
7792	Analin Oil, 100 cc. inc.	.35
7795	Immersion Oil for Objectives, 30 cc.	.45
7808	Canada Balsam, 20 cc. in collapsable tubes,	.20
7809	Canada Balsam in Benzol, 30 cc.	.40
7821	Glycerine Jelly, 30 cc.	.50
7831	White Zinc Cement, 30 cc.	.40
7835	Celloidin, 30 grams	1.30
7840	Paraffin, 500 grams,	.25
7845	Agar Agar, 500 grams,	1.00
7847	Gelatine, gold label, 500 grams,	.90
7848	Peptonum Siccum, Witte's. 125 grams,	1.00
7861	Bismark Brown, cryst. 10 grams,	.20
7863	Borax Carmine, Grenacher's 30 cc.	.35
7864	Burrill's Stain for Baccillus tuberculosis, 30 cc.	.40
7868	Chenzinskie's Eosin Methylen blue, 60 cc.	.60
7870	Congo Red, 10 grams cryst.	.20
7873	Dahlia Violet, 10 grams, cryst.	.20
7874	Eosin, 10 grams, cryst.	.30
7876	Ehrlich's triple stain for blood, 60 cc.	.60
7878	Fuchsin Acid, 10 grams, cryst.	.25
7879	Gibbs' double stain for Bacillus tuberculosis, 30 cc.	.35
7880	Gentian Violet, 10 grams cryst.	.30
7884	Haematoxylin, Delafield's, 30 cc.	.25
7889	Loefflers alkaline blue sol. 30 cc.	.25
7894	Methyl Blue, 10 grams cryst.	.20
7896	Methyl Violet, 10 grams cryst.	.30
7897	Methylin Blue, 10 grams cryst.	.30
7903	Picro Carmine (Weigert's) 30 cc.	.50
7906	Rosanilin Hydrochlorid, 10 grams cryst.	.30
7917	Violet B. 10 grams,	.20
7918	Ziehl's Carbol-fuchsin sol. 30 cc.	.25

Detmers-Robinson
Aseptic Hypodermic Syringe.

(Patent Applied For.)



ONLY

THREE

PIECES.

Showing Plunger graduated to one-tenth c. c., section of Barrel and Needle.

Note that the steel needle tube traverses the entire base of the needle

Complete Syringe.
One-half actual size.

Price Complete, with two Needles in Case,

$2.50

MECHANICALLY PERFECT AND
PERFECTLY ASEPTIC.

The only Hypodermic Syringe made in which the needle contains no hilus for the collection of dirt, bacteria, etc. Plunger is a solid piece of metal, absolutely no packing used any where and no lubricant required. Needle slips into barrel without thread.

This syringe cannot get out of order and is the only one which can be easily and perfectly sterilized.